# Pictured Rocks National Lakeshore

# Personal Watercraft Use Environmental Assessment

# Errata

The following changes have been made to the *Personal Watercraft Use Environmental Assessment* for Pictured Rocks National Lakeshore (July 2002) to modify the preferred alternative and its analysis, to address public comments, and to clarify the text. Additions are identified by underlines, and deletions by strikethrough.

## SUMMARY

Pages v–vii, Table A — Change impacts for alternative B (preferred alternative) as follows:

**TABLE A: SUMMARY OF THE IMPACT ANALYSIS**

| Impact Topic | Alternative B: Continue PWC Use under a Special NPS Regulation with Management Restrictions (Preferred Alternative) |
|---|---|
| **Water Quality** | Based on analyses of individual pollutants, negligible to minor adverse impacts. No impacts east of Miners Beach. ~~in the Beaver Basin segment~~. However, total PAH concentrations in the Sand Point segment and the western 1 mile of the Cliffs segment could have minor to moderate adverse phototoxic effects on aquatic life, depending on local weather and water clarity conditions. |
| **Air Quality** | |
| • **Impacts to Human Health from Airborne Pollutants Related to PWC Use** | Negligible adverse impacts for all pollutants, with PWC use excluded east of Miners Beach. ~~in the Beaver Basin segment.~~ |
| • **Impacts to Air Quality Values from Pollutants Related to PWC Use** | Negligible to moderate adverse impacts. |
| **Soundscape** | ~~Short-term, negligible impacts at most locations, and~~ Short- and long-term moderate ~~minor~~ adverse impacts in the area of designated use. ~~near the Sand Point launch. (similar to alternative A).~~ ~~Negligible~~ Minor beneficial impacts from eliminating PWC use east of Miners Beach. ~~in the Beaver Basin segment since other motorized watercraft could still be heard but farther away and less frequently.~~ |

| Impact Topic | Alternative B: Continue PWC Use under a Special NPS Regulation with Management Restrictions (Preferred Alternative) |
|---|---|
| **Wildlife and Wildlife Habitat** | Negligible impacts at most locations; negligible beneficial impacts in areas where use was prohibited. ~~the Beaver Basin segment.~~ |
| **Threatened or Endangered Species or Species of Special Concern** | No effect on the piping plover, pitcher's thistle, or Lake Huron tansy, and not likely to adversely affect the common loon or the peregrine falcon. ~~other federal or state listed species (similar to alternative A).~~ |
| **Shoreline Vegetation** | Negligible adverse impacts in the Sand Point segment and the western 1 mile of the Cliffs segment, ~~throughout most of the lakeshore,~~ negligible beneficial impacts east of Miners Beach. ~~in the Beaver Basin segment.~~ |
| **Visitor Experiences** | Moderate, long-term, adverse impacts on PWC users, who would be limited in their location of operation within the national lakeshore. Negligible to moderate beneficial ~~adverse~~ impacts on visitor experiences of other visitors in most areas, particularly for those ~~moderate, beneficial impacts from PWC restrictions in the Beaver Basin segment for~~ visitors desiring backcountry experiences. |
| **Visitor Conflicts and Safety** | Minor, adverse impacts in the Sand Point area due to the number of visitors and boats on high use days (similar to alternative A); negligible impacts at other locations of use. Negligible, beneficial impacts due to eliminating PWC use east of Miners Beach. ~~in the Beaver Basin segment.~~ |
| **Cultural Resources (Archeological Sites, Submerged Cultural Resources, Ethnographic Resources)** | Minor adverse impacts on potentially listed archeological sites and submerged cultural resources within the Sand Point segment and the western 1-mile portion of the Cliffs segment, but beneficial impacts on ~~those~~ resources east of Miners Beach. ~~in the Beaver Basin segment.~~ Due to boat patrols, minor, adverse impacts during the permitted use of ethnographic resources. |
| **Preserve Operations** | Moderate adverse impacts (similar to alternative A) because more staff, funding, and equipment needed to ensure full compliance with use restrictions east of Miners Beach ~~in the Beaver Basin segment~~ and during the permitted use of ethnographic resources. |

# PURPOSE OF AND NEED FOR ACTION

Page 1, paragraph 2 — Change last sentence as follows:

> PWC recreation was ~~is~~ the fastest growing segment of the boating industry through the mid 1990s, representing over one-third of total sales.

Page 1, paragraph 6, line 1 — Correct the agency name as follows:

> National Oceanic and Atmospheric Administration ~~Agency~~.

### SUMMARY OF AVAILABLE RESEARCH ON THE EFFECTS OF PERSONAL WATERCRAFT

Page 10, "Noise," first paragraph, last two sentences — Change to read as follows:

> Because of this, the National Park Service contracted noise measurements of personal watercraft and other boat types in 2001 at Glen Canyon National Recreation Area; preliminary analysis of this data indicates maximum levels for PWC-generated noise at 82 ~~50~~ feet of approximately 68 to 78 A-weighted dB (dBA). Other motorboat types were measured during that study at approximately 65 to 86 dBA at 50 feet (Harris Miller Miller & Hanson 2002).

### OBJECTIVES IN TAKING ACTION

Page 13, "National Lakeshore Management and Operations" — Change first bulleted item as follows:

- Minimize impacts ~~inputs~~ to park operations from increased enforcement needs.

# ALTERNATIVES

Page 21, Alternative B — Change as follows:

> **ALTERNATIVE B: CONTINUE PWC USE UNDER A SPECIAL NPS REGULATION WITH MANAGEMENT RESTRICTIONS (PREFERRED ALTERNATIVE)**
>
> Under alternative B a special NPS regulation would continue PWC use after April 2002 with the following stipulations:
>
> - PWC use would be allowed to operate on the waters of Lake Superior within the boundaries of ~~continue as currently provided and managed within~~ Pictured Rocks National Lakeshore from the western boundary of the lakeshore up to the east end of Miners Beach. ~~except use would be discontinued in the areas designated as primitive under a draft or final general management plan. (According to legislation, a primitive area is closed to all motorized vehicles; at Pictured Rocks the potential primitive area~~

~~extends 0.25 mile into Lake Superior from the shoreline, between Spray Falls and 1.25 miles east of Sevenmile Creek.)~~

- PWC use would be allowed under the following conditions:

  Personal watercraft may only be launched from a designated launch site at Sand Point.

  PWC users may beach their craft on Miners Beach.

  PWC users may not launch or operate in any other area of the lakeshore.

- The superintendent may temporarily limit, restrict, or terminate access to areas designated for PWC use after taking into consideration public health and safety, natural and cultural resource protection, and other management activities and objectives.
- PWC use would be restricted at specific locations during the permitted use of ethnographic resources. Boat patrols would be conducted in the vicinity of the ethnographic resource use in order to reduce the potential for PWC-related intrusion into the ceremonial activity.
- PWC users would continue to abide by Michigan's Personal Watercraft Safety Act of 1998 (Public Act 116) and related regulations, as identified in alternative A.

This alternative would allow unrestricted PWC use along the Lake Superior shoreline within the western end ~~most~~ of the park, covering approximately 8 miles of shoreline. ~~with the exception of the Beaver Basin area between Spray Falls and 1.25 miles east of Sevenmile Creek.~~ The numbers of personal watercraft would not be restricted. ~~but no landing would be allowed within the primitive area of the national lakeshore.~~ Alternative B is the lakeshore's preferred alternative and the environmentally preferred alternative.

**THE ENVIRONMENTALLY PREFERRED ALTERNATIVE**

Page 22, paragraph 3 (discussion of alternative B) — Change the second sentence as follows:

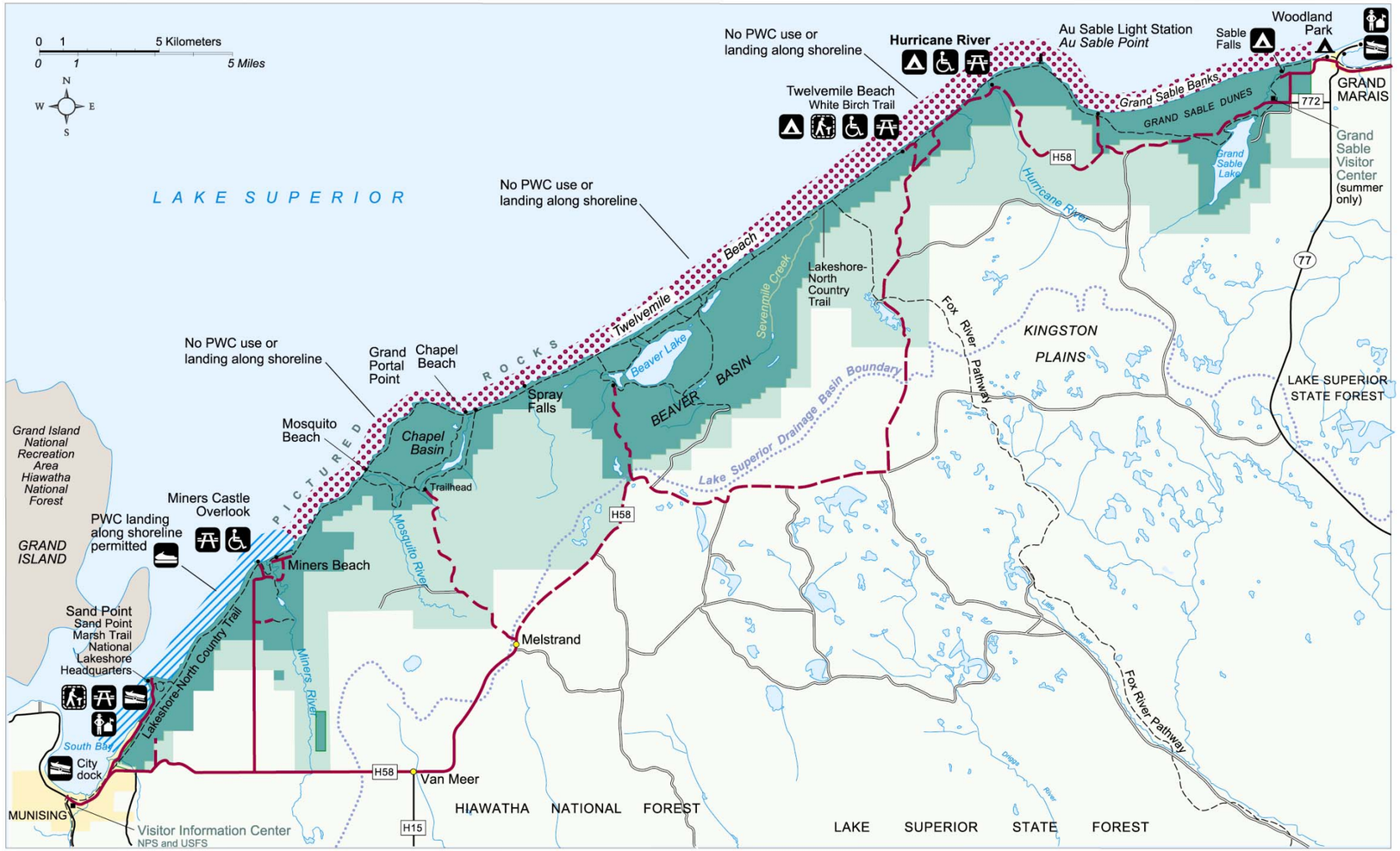
However, alternative B would better meet park goals with respect to the protection of visitor experience and ethnographic resource use by prohibiting PWC use east of Miners Beach ~~adjacent to the proposed primitive area~~ and by restricting PWC activities during the permitted use of ethnographic resources.

Page 25, Map of Alternative B — Replace the map with the corrected version on the next page.

# Pictured Rocks National Lakeshore

Michigan

## Alternative B -- Continue PWC Use under a Special Regulation with Management Restrictions

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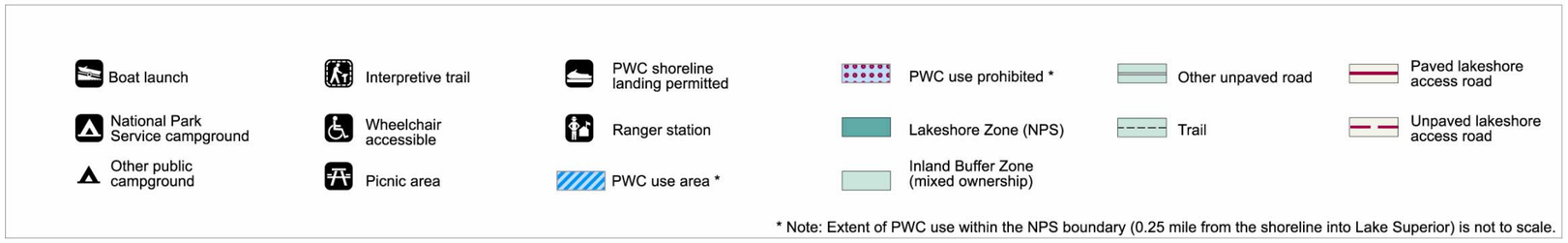


* Note: Extent of PWC use within the NPS boundary (0.25 mile from the shoreline into Lake Superior) is not to scale.

## SUMMARY OF ALTERNATIVES AND IMPACTS

Page 29, Table 1 — Change the second row of the table as follows:

**TABLE 1: SUMMARY OF ALTERNATIVES**

| | Alternative A: Continue PWC Use as Currently Managed under a Special NPS Regulation | Alternative B: Continue PWC Use under a Special NPS Regulation with Management Restrictions (Preferred Alternative) |
|---|---|---|
| Use Area | Permit PWC use within the 0.25-mile NPS boundary in Lake Superior, with operation within 200 feet of the shoreline restricted to ~~at~~ a slow, no-wake speed and travel~~ing~~ perpendicular to the shore. | Same as alternative A, except discontinue use east of Miners Beach, ~~in primitive area adjacent to potential wilderness (Beaver Basin area);~~ and restrict use during the permitted use of ethnographic resources. |

Pages 29–33, Table 2 — Change the impact conclusions for alternative B as follows:

**TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

| Impact Topic | Alternative B: Continue PWC Use under a Special NPS Regulation with Management Restrictions (Preferred Alternative) |
|---|---|
| **Water Quality** | Based on analyses of individual pollutants, alternative B would have negligible to minor adverse effects on water quality due to continued PWC use. No impacts would occur east of Miners Beach. ~~in the Beaver Basin segment. While~~ All pollutant concentrations ~~loads~~ would be well below benchmarks and criteria. However, total PAH concentrations in the Sand Point segment and the western 1 mile of the Cliffs segment could have minor ~~negligible~~ to moderate ~~minor~~ adverse phototoxic effects on aquatic life, depending on local weather and water clarity conditions.<br>Cumulative impacts from PWC and motorized boat use would range from negligible to moderate. No impacts would occur in the Beaver Basin segment. Total PAH concentrations could ~~would~~ be a concern for aquatic life, due to potential phototoxicity. Benzene concentrations could be detectable, but are expected to remain below the human health criterion. By 2012 impacts would be reduced substantially through improved emission controls. Impacts could be less than predicted due to mixing with nearby waters. |

| Impact Topic | Alternative B: Continue PWC Use under a Special NPS Regulation with Management Restrictions (Preferred Alternative) |
|---|---|
| **Air Quality** | |
| • **Impacts to Human Health from Airborne Pollutants Related to PWC Use** | Continuing PWC use at Pictured Rocks National Lakeshore at existing levels, with PWC use excluded east of Miners Beach, ~~in the Beaver Basin segment,~~ would result in negligible adverse impacts for all pollutants. |
| • **Impacts to Air Quality Values from Pollutants Related to PWC Use** | The number of personal watercraft operating within Pictured Rocks National Lakeshore would be the same as alternative A, even though no use would be allowed east of Miners Beach. ~~in the Beaver Basin segment.~~ PWC-related air quality impact levels would range from negligible to moderate adverse. |
| **Soundscapes** | Noise from personal watercraft would continue to have short- and long-term, moderate ~~negligible~~ adverse impacts in the area of designated use. ~~at most locations, and short-term, minor, adverse impacts near the Sand Point launch.~~ Impact levels would be related to the number of personal watercraft operating, as well as the sensitivity of other visitors. Eliminating PWC use east of Miners Beach ~~in the Beaver Basin segment~~ would have minor ~~negligible~~ beneficial impacts. ~~since watercraft could still be heard but would be farther away and less frequent.~~ |
| **Wildlife and Wildlife Habitat** | Due to the distance that PWC users are required to be from the shoreline, impacts on wildlife and wildlife habitat would be negligible at most locations. Prohibiting ~~Closing the Beaver Basin segment to~~ PWC use east of Miners Beach would have negligible beneficial impacts. |
| **Threatened or Endangered Species or Species of Special Concern** | PWC use would have no effect on the piping plover, the pitcher's thistle, or the Lake Huron tansy, and would not be likely to adversely affect the common loon or the peregrine falcon ~~other federal or state listed species~~ since interactions would be extremely limited. |
| **Shoreline Vegetation** | PWC use would have negligible adverse impacts in the Sand Point segment and the western 1 mile of the Cliffs segment over the short and long term because there have been ~~would be~~ no perceptible changes to plant community size, integrity or continuity now, and none are expected in the future. Restricting PWC use east of Miners Beach ~~restriction in the Beaver Basin segment~~ would result in negligible beneficial impacts over the short and long term. |
| **Visitor Experience** | PWC users would be limited in their location of operation within the national lakeshore and could notice a |

| Impact Topic | Alternative B: Continue PWC Use under a Special NPS Regulation with Management Restrictions (Preferred Alternative) |
|---|---|
| | slight increase in the density of use in the vicinity of Sand Point. As a result, they would experience moderate, long-term, adverse impacts. Restricting ~~Continued~~ PWC use east of Miners Beach would have negligible beneficial ~~adverse~~ impacts on the experiences of most other visitors in the short and long term, and it ~~restrictions within the Beaver Basin segment~~ would have long-term, moderate, beneficial impacts on those visitors desiring back-country experiences with natural "quiet." The level of PWC use would remain relatively low at ~~other~~ lakeshore locations. When related to other visitor activities, PWC use would not appreciably limit the critical characteristics of visitor experiences. |
| **Visitor Conflicts and Safety** | Continued PWC use would have short- and long-term, minor, adverse impacts on visitor conflicts and safety, particularly in the Sand Point area, due to the number of visitors and boats present on high-use days. Conflicts at other locations would remain negligible. Conflicts would be eliminated east of Miners Beach. ~~in the Beaver Basin segment, resulting in negligible, beneficial impacts.~~ |
| **Cultural Resources (Archeological Sites, Submerged Cultural Resources, Ethnographic Resources)** | PWC use in the Sand Point segment and the western 1 mile of the Cliffs segment ~~and Grand Sable segments~~ could have minor adverse impacts on potentially listed archeological sites and submerged resources from possible illegal collection and vandalism. There would be a beneficial impact on those resources east of Miners Beach, ~~in the Beaver Basin segment,~~ where PWC use would be discontinued. Boat patrols would limit potential PWC and boat-related intrusions during the permitted use of ethnographic resources, resulting in possible short-term, minor, adverse impacts. |
| **Preserve Operations** | Similar to alternative A, this alternative would have moderate adverse impacts on park operations. More staff, funding, and equipment would be needed to ensure full compliance with PWC and motorized use restrictions east of Miners Beach ~~in the Beaver Basin segment~~ and during the permitted use of ethnographic resources, as well as to regulate motorized uses in other portions of the lakeshore. |

# AFFECTED ENVIRONMENT

## VISITOR USE AND EXPERIENCE

### PWC Use

Page 51, first paragraph after "PWC Use" heading — Add the following as the last sentence:

> Such areas include other portions of Lake Superior (excluding the shore of Grand Island), many lakes within the Escanaba River and Lake Superior State Forests, several lakes within the Hiawatha National Forest, Manistique Lake, South Manistique Lake, and Lake Michigan.

# ENVIRONMENTAL CONSEQUENCES

## PWC AND OTHER VISITOR USE TRENDS

### PWC Use

Page 61, Table 11 — Change as follows:

**TABLE 1: MICHIGAN JET SKI AND JETBOAT REGISTRATION STATISTICS, 1995–2001**

| Year | Jet Skis | Jetboats | Total | Percentage Increase |
|---|---|---|---|---|
| 1995 | 57,790 | 5,702 | 63,492<br>~~65,487~~ | |
| 1996 | 70,844 | 4,901 | 75,745<br>~~77,741~~ | 19% |
| 1997 | 78,897 | 6,500 | 85,397<br>~~87,394~~ | 13%<br>~~12%~~ |
| 1998 | 83,950 | 6,982 | 90,932<br>~~92,930~~ | 6% |
| 1999 | 88,272 | 7,288 | 95,560<br>~~97,559~~ | 5% |
| 2000 | 108,998 | 53,563 | 162,558<br>~~164,561~~ | Not Applicable* |
| 2001 | 109,765 | 53,771 | 163,536 | 1%<br>~~-1%~~ |

* In 2000 the parameters for counting Jetboats were changed. Thus, the change in registration (compared to 1999) is not applicable. Prior to 2000, Jetboats included personal watercraft measuring 13 to 16 feet. After 2000, Jetboats included personal watercraft measuring 13 to 22 feet.

Page 61, 4th paragraph — Change second sentence as follows:

> For example, no personal watercraft would be operated east of Miners Beach ~~between Spray Falls and 1.25 miles east of Sevenmile Creek~~ under alternative B.

Page 62, Table 12 — Change PWC numbers for alternative B as follows:

**TABLE 12: PEAK DAILY VISITOR NUMBERS, JULY AND AUGUST**

| User Groups | Segment 1 Sand Point Segment (7.0 miles) | | Segment 2 Cliffs Segment (8.2 miles) | | Segment 3 Beaver Basin Segment (10.2 miles) | | Segment 4 Grand Sable Segment (14.3 miles) | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **2002** | **2012** | **2002** | **2012** | **2002** | **2012** | **2002** | **2012** | **2002** | **2012** |
| Alternative B: Continue PWC Use with Management Restrictions | | | | | | | | | | |
| Personal Watercraft[1] | 8 ~~6~~ | 9 ~~7~~ | 5 | 7 | 0 | 0 | 0 ~~2~~ | 0 ~~2~~ | 13 | 16 |

Note: Based on visitor use statistics, as well as discussions with national lakeshore staff, no overall increase in park visitation is anticipated over the next 10 years.

1. Existing and future (2012) PWC numbers based on survey completed over July 4th weekend, 2001. Numbers indicate peak weekend during peak visitor season. Assume 1.5 persons per PWC, all of which would land on shore.

## WATER QUALITY

### Methodology and Assumptions

Page 67, last paragraph — Change as follows:

- Total PAHs (benzo[a]pyrene, naphthalene, and 1-methyl naphthalene) do not have a water quality standard. Some research indicates that PAHs have phototoxic effects in oligotrophic lakes that have high light penetration (Oris ~~Ortis~~ et al. 1998). At Pictured Rocks National Lakeshore, Lake Superior is oligotrophic, has low suspended solids on which PAHs can attach, and has high light penetration. Limited data indicate that in these conditions, PAHs may have phototoxic effects on fish and zooplankton at very low concentrations (less than 0.1 µg/L). Based on the data available, this evaluation assumes that potential phototoxic impacts may occur whenever PAH concentrations are greater than 0.1 µg/L (i.e., using the same order of magnitude as data indicate). The results of the water quality analysis are shown as thresholds for all pollutants; however, total PAHs are shown as a concentration (µg/L).

### Impact to Water Quality from PWC Use

Pages 71–73, "Impacts of Alternative B" — Revise the discussion of impacts as follows:

**Analysis.** PWC use would continue within the lakeshore, with a shift in location due to restrictions east of Miners Beach. ~~in the Beaver Basin segment.~~ Overall numbers of personal watercraft would remain the same as alternative A, with maximum use projected to increase from 13 per day in 2002 to 16 per day in 2012. For 2002 PWC use in the peak season would be ~~users would operate for~~ 37 ~~31~~ PWC-hours per day in the Sand Point segment and 15 ~~17~~ PWC-hours in the western 1 mile of the Cliffs segment. ~~and 2 hours in the Grand Sable segment.~~ Daily peak operation times would increase in 2012 to 43 ~~37~~ PWC-hours in the Sand Point segment and 21 ~~23~~ PWC-hours in the Cliffs segment. ~~and 2 hours in the Grand Sable segment.~~ Water quality impacts east of Miners Beach ~~in the Beaver Basin segment~~ would be reduced compared to alternative A, since PWC use would not be allowed in this area.

~~Most~~ PWC users would operate within ~~near~~ the Sand Point and the Cliffs segments because of the closure of other areas to the east ~~Beaver Basin~~ and proximity to the launch facility at Sand Point. The Sand Point area (segment 1) would have the highest use and highest pollutant loads (see Table 17). This location also tends to have shallower waters that extend for some distance

offshore. Over the next 10 years PWC use in this segment is projected to increase from eight ~~six~~ to nine ~~seven~~ machines per day.

**TABLE 17: THRESHOLD WATER VOLUMES NEEDED TO DILUTE PWC EMISSIONS, ALTERNATIVE B**

| Parameter | Pollutant | Calculated Threshold Volumes (acre-feet) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Sand Point (Segment 1) | | Cliffs (Segment 2) | | Beaver Basin (Segment 3) | | Grand Sable (Segment 4) | |
| | | 2002 | 2012 | 2002 | 2012 | 2002 | 2012 | 2002 | 2012 |
| Volume Available | | 24,006 | | 3,404* ~~27,972~~ | | 29,716 | | 21,354 | |
| Ecological Benchmark | Benzo[a]pyrene | 51 ~~43~~ | 30 ~~26~~ | 21 ~~24~~ | 15 ~~16~~ | 0 | 0 | 0 ~~2.8~~ | 0 ~~1.4~~ |
| | Naphthalene | 20 ~~17~~ | 12 ~~10~~ | 8.2 ~~9.3~~ | 5.8 ~~6.3~~ | 0 | 0 | 0 ~~1.1~~ | 0 ~~0.5~~ |
| | 1-methyl naphthalene | 58 ~~48~~ | 33 ~~29~~ | 23 ~~26~~ | 16 ~~18~~ | 0 | 0 | 0 ~~3.1~~ | 0 ~~1.6~~ |
| | Benzene | 24 ~~20~~ | 14 ~~12~~ | 10 ~~11~~ | 7 ~~8~~ | 0 | 0 | 0 ~~1.3~~ | 0 ~~0.7~~ |
| | Total PAH Con-centration (µg/L) | 0.13 ~~0.11~~ | 0.08 ~~0.07~~ | 0.38 ~~0.05~~ | 0.27 ~~0.04~~ | 0 | 0 | 0 ~~0.01~~ | 0 ~~0.0~~ |
| Human Health Criteria | Benzo[a]pyrene | 160 ~~140~~ | 95 ~~81~~ | 66 ~~75~~ | 46 ~~51~~ | 0 | 0 | 0 ~~8.8~~ | 0 ~~4.4~~ |
| | Benzene | 2,600 ~~2,200~~ | 1,500 ~~1,300~~ | 1,100 ~~1,200~~ | 740 ~~810~~ | 0 | 0 | 0 ~~140~~ | 0 ~~71~~ |

*Note that the mixing volume available for the PWC use area of the Cliffs segment is limited to the western 1 mile of the segment. This conservative assumption does not consider lateral mixing with along-shore or offshore waters.

The calculated threshold volumes to meet ecological benchmarks range from 0 acre-feet in the Beaver Basin and Grand Sable segments for all contaminants to 58 ~~48~~ acre-feet for 1-methyl naphthalene in the Sand Point segment. These volumes are all extremely small in relation to the volume of water available (greater than 24,000 acre-feet). In the Cliffs segment the maximum threshold volume is 23 acre-feet, with 3,404 acre-feet available in the PWC use area. ~~indicating that~~ These pollutant loads would be well below the ecological benchmarks, and there would be a negligible adverse impact.

None of the pollutant levels would exceed the human health criteria for water (ingestion of aquatic organisms and water). In the Sand Point segment, benzene loads would require ~~approximately~~ 2,600 ~~2,200~~ acre-feet for dilution, approximately ~~less than~~ 10% of the threshold volume of water available. The benzene threshold volume in the western portion of the Cliffs segment would be 31% of the volume available for dilution. Therefore, PWC use would have a negligible adverse impact on human health.

As described in the methodology section and for alternative A, some literature indicates that low ~~small~~ PAH concentrations may have toxic effects on aquatic organisms, particularly in oligotrophic lakes (Oris et al. 1998). Alternative B assumes a more concentrated use of personal watercraft in the Sand Point segment and the western 1 mile of the Cliffs segment. As a result, total ~~Total~~ PAH concentrations in 2002 could be 0.13 µg/L in the Sand Point segment and 0.38 µg/L in the western end of the Cliffs segment. ~~could be greater than 0.1 µg/L~~. These ~~This~~ concentrations would be greater than the threshold for potentially ~~is within the range for potential~~ adverse effects to aquatic life (0.1 µg/L), particularly on sunny days when phototoxicity can occur. For this reason, total PAHs under alternative B could have ~~a negligible to minor~~ moderate impacts on water quality depending on local weather and water clarity conditions. By 2012 impacts would be less because of required improvements in engine technology, and ~~the~~ impacts to aquatic life from PAHs would be ~~negligible~~ minor in the Sand Point unit. Impacts to aquatic life by 2012 in the Cliffs segment could still be moderate due to PAH levels above 0.1 µg/L. Impacts to aquatic life in the Sand Point segment and the western

1 mile of the Cliffs segment are expected to be less than predicted for both 2002 and 2012, however, due to mixing with along-shore and offshore waters outside the segments.

The number of personal watercraft is ~~are~~ projected to increase in 2012 by approximately 20%. However, pollutant loads would be lower than 2002 conditions because of the estimated 50% reduction in engine emissions. All segments would see reduced pollutant loads by 2012.

**Cumulative Impacts.** As described for alternative A, other activities that could contribute pollutants to the Pictured Rocks shoreline and Lake Superior include recreational boating, commercial fishing, tour boats, and commercial boating. Of these activities, recreational boating is the most prominent source of additional pollutant loading (for pollutants of concern). Hours and location of operation would be shifted slightly, as compared to alternative A due to Beaver Basin restrictions. Pollutant loads would be more concentrated near Sand Point because of the proximity to launching facilities (see Table 18). The evaluation of the Cliffs segment focuses on the western 1 mile, where both personal watercraft and boats would be allowed to operate. The number of boats operating in this area was assumed to be one-eighth of those operating within the entire 8-mile segment.

**TABLE 18: THRESHOLD WATER VOLUMES NEEDED TO DILUTE PWC AND MOTORIZED BOAT EMISSIONS, ALTERNATIVE B**

| | | Calculated Threshold Volumes (acre-feet) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Sand Point (Segment 1) | | Cliffs (Segment 2) | | Beaver Basin (Segment 3) | | Grand Sable (Segment 4) | |
| Parameter | Pollutant | 2002 | 2012 | 2002 | 2012 | 2002 | 2012 | 2002 | 2012 |
| Volume Available | | 24,006 | | 3,404* ~~27,972~~ | | 29,716 | | 21,354 | |
| Ecological Benchmark | Benzo[a]pyrene | 210 ~~200~~ | 120 ~~120~~ | 36 ~~150~~ | 24 ~~91~~ | 0 | 0 | 46 ~~48~~ | 34 ~~35~~ |
| | Naphthalene | 83 ~~80~~ | 49 ~~47~~ | 14 ~~60~~ | 10 ~~36~~ | 0 | 0 | 18 ~~19~~ | 13 ~~14~~ |
| | 1-methyl naphthalene | 240 ~~230~~ | 140 ~~130~~ | 40 ~~170~~ | 27 ~~100~~ | 0 | 0 | 51 ~~54~~ | 38 ~~40~~ |
| | Benzene | 99 ~~95~~ | 58 ~~56~~ | 17 ~~71~~ | 11 ~~43~~ | 0 | 0 | 22 ~~23~~ | 16 ~~17~~ |
| | Total PAH Concentration (μg/L) | 0.55 ~~0.53~~ | 0.32 ~~0.31~~ | 0.66 ~~0.34~~ | 0.45 ~~0.21~~ | 0 | 0 | 0.13 ~~0.14~~ | 0.10 ~~0.10~~ |
| Human Health Criteria | Benzo[a]pyrene | 670 ~~640~~ | 390 ~~380~~ | 114 ~~480~~ | 77 ~~290~~ | 0 | 0 | 140 ~~150~~ | 110 ~~110~~ |
| | Benzene | 10,800 ~~10,000~~ | 6,300 ~~6,100~~ | 1,840 ~~7,700~~ | 1,240 ~~4,700~~ | 0 | 0 | 2,300 ~~2,500~~ | 1,700 ~~1,800~~ |

*Note that the mixing volume available for the PWC use area in the Cliffs segment, which is also used by other motorized boats, is limited to the western 1 mile of the segment. This conservative assumption does not consider lateral mixing with along-shore or offshore waters.

The calculated threshold volumes for pollutants emitted by personal watercraft and boats would range from 0 to 240 ~~230~~ acre-feet for the ecological criteria. The 1-methyl naphthalene volume for Sand Point (240 ~~230~~ acre-feet) would be less than 1% of the volume available. These pollutant concentrations ~~loads~~ are well below the water quality benchmarks and would likely not be detectable. Cumulative ecological impacts under alternative B would be negligible.

Threshold volumes for the human health criteria range from 0 to 10,800 ~~10,000~~ acre-feet. Benzene emissions in the Sand Point segment would have the highest concentrations and would require 45% ~~42%~~ of the total water volume available within the 0.25-mile jurisdictional boundary for dilution. Benzene levels would be below the human health criterion. As described for alternative A, dilution with adjacent waters and volatilization would ~~also~~ occur, so that benzene concentrations would be further decreased. Cumulative human health based

impacts would be negligible to minor. If the state water quality standard for benzene was used in place of the EPA criterion, estimated human health impacts from benzene would be even lower. ~~Cumulative human health based impacts would be negligible to minor.~~

Total PAH concentrations in all three segments with boating activity ~~would~~ could equal or exceed 0.1 µg/L in 2002 and 2012. Predicted concentrations range from 0.66 µg/L in the Cliffs segment in 2002 to 0.10 µg/L in the Grand Sable segment in 2012. ~~Although the calculated levels are well below aquatic life benchmarks, the~~ These concentrations could have a minor to moderate adverse impact to aquatic life due to phototoxic effects (as discussed above). Impacts within all segments are expected to be less than predicted for both 2002 and 2012, however, due to mixing with along-shore and offshore waters outside the segments.

Future (2012) pollutant loads would decrease, despite increased boating traffic, due to reductions in engine emissions. Impact levels for cumulative actions would be negligible to moderate, depending on the location and pollutant type. All effects would be short term and would occur during the times of heaviest use.

**Conclusion.** Based on analyses of individual pollutants, alternative B would have negligible to minor adverse effects on water quality due to continued PWC use. No impacts would occur east of Miners Beach. ~~in the Beaver Basin segment. While~~ All pollutant concentrations ~~loads~~ would be well below benchmarks and criteria. However, total PAH concentrations in the Sand Point segment and the western 1 mile of the Cliffs segment could have minor ~~negligible~~ to moderate ~~minor~~ adverse phototoxic effects on aquatic life, depending on local weather and water clarity conditions.

Cumulative impacts from PWC and motorized boat use would range from negligible to moderate. No impacts would occur in the Beaver Basin segment. Total PAH concentrations could ~~would~~ be a concern for aquatic life, due to potential phototoxicity. Benzene concentrations could be detectable, but are expected to remain below the human health criterion. By 2012 impacts would be reduced substantially through improved emission controls. Impacts could be less than predicted due to mixing with nearby waters.

Implementation of this alternative would not result in an impairment of the water quality resource.

## AIR QUALITY

### Impact to Human Health from Airborne Pollutants Related to PWC Use

Page 78, Impact thresholds — Change the text as follows:

| | **Activity Analyzed** | | **Current Air Quality** |
|---|---|---|---|
| *Negligible:* | Emissions would be less than 50 tons/year for each pollutant. | **and** | The first highest 3-year maximum for each pollutant is ~~would be~~ less than NAAQS. |
| *Minor:* | Emissions would be less than 100 tons/year for each pollutant. | **and** | The first highest 3-year maximum for each pollutant is ~~would be~~ less than NAAQS. |
| *Moderate:* | Emissions would be greater than or equal to 100 tons/year for any | **or** | The first highest 3-year maximum for each pollutant is ~~would be~~ |

| | | | |
|---|---|---|---|
| | pollutant. | | greater than NAAQS. |
| *Major:* | Emissions levels would be greater than or equal to 250 tons/year for any pollutant. | **and** | The first highest 3-year maximum for each pollutant <u>is</u> ~~would be~~ greater than NAAQS. |

*Impairment:* Air emissions would ~~contribute to continued violation of national standards. In addition, impacts~~ have a major adverse effect on park resources and values and would

contribute to deterioration of the park's air quality to the extent the park's purpose could not be fulfilled as established in its enabling legislation;

affect resources key to the park's natural or cultural integrity or opportunities for enjoyment; or

affect the resource whose conservation is identified as a goal in the park's general management plan or other park planning documents.

Page 80, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** Under this alternative the number of personal watercraft used daily in the lakeshore would follow the same trends as alternative A, ranging from 13 in 2002 to 16 in 2012. The impacts of continued PWC use within the lakeshore, but with restrictions <u>east of Miners Beach,</u> ~~in the Beaver Basin segment,~~ would be the same as those described for alternative A. All impact levels would be negligible, since the emissions would all be less than 50 tons/year.

**Conclusion.** Continuing PWC use at Pictured Rocks National Lakeshore at existing levels, with PWC use excluded <u>east of Miners Beach,</u> ~~in the Beaver Basin segment,~~ would result in negligible adverse impacts for all pollutants.

**Impact to Air Quality Related Values from PWC Pollutants**

Page 81, Impact thresholds — Change the text as follows:

| | **<u>Activity Analyzed</u>** | | **<u>Current Air Quality</u>** |
|---|---|---|---|
| *Negligible:* | Emissions would be less than 50 tons/year for each pollutant. | **and** | There <u>are</u> ~~would be~~ no perceptible visibility impacts (photos or anecdotal evidence).<br>**and**<br>There <u>is</u> ~~would be~~ no observed ozone injury on plants.<br>**and**<br>SUM06 ozone <u>is</u> ~~would be~~ less than 12 ppm-hrs. |
| *Minor:* | Emissions would be less than 100 tons/year for each pollutant. | **and** | SUM06 ozone <u>is</u> ~~would be~~ less than 15 ppm-hrs. |
| *Moderate:* | Emissions would be 100–249 tons/year for any pollutant.<br>**or**<br>Visibility impacts from cumulative PWC emissions would be likely (based on past visual observations). | **or** | Ozone injury symptoms <u>are</u> ~~would be~~ identifiable on plants.<br>**and**<br>SUM06 ozone <u>is</u> ~~would be~~ less than 25 ppm-hrs. |

| | | |
|---|---|---|
| *Major:* | Emissions would be equal to or greater than 250 tons/year for any pollutant.<br>**or**<br>Visibility impacts from cumulative PWC emissions would be likely (based on modeling or monitoring). | **and** Ozone injury symptoms <u>are</u> ~~would be~~ identifiable on plants.<br>**or**<br>SUM06 ozone <u>is</u> ~~would be~~ greater than 25 ppm-hrs. |

*Impairment:* ~~Air quality related values in the park would be adversely affected. In addition,~~ Impacts would have a major adverse effect on park resources and values and would

contribute to deterioration of the park's air quality to the extent the park's purpose could not be fulfilled as established in its enabling legislation;

affect resources key to the park's natural or cultural integrity or opportunities for enjoyment; or

affect the resource whose conservation is identified as a goal in the park's general management plan or other park planning documents.

Page 83, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** Under this alternative daily PWC use within the national lakeshore would be the same as alternative A, but with restrictions <u>east of Miners Beach.</u> ~~in the Beaver Basin segment.~~ Emission rates and impact levels would be the same as alternative A because the number of personal watercraft operating within the lakeshore would not change. All pollutant loads would be less than 20 tons/year, with negligible to moderate impact levels.

**Conclusion.** The number of personal watercraft operating within Pictured Rocks National Lakeshore would be the same as alternative A, <u>except that PWC use would be prohibited east of Miners Beach.</u> PWC-related air quality impact levels would range from negligible to moderate <u>adverse</u>.

## SOUNDSCAPES

### Methodology and Assumptions

Page 87, "Intensity" — Change to read as follows:

**Intensity:** Personal watercraft have been measured to emit 85 to 105 dB per unit, which may disturb visitors. Noise limits established by the National Park Service are 82 dB at 82 feet. <u>As previously stated, noise measurements of personal watercraft and other boat types in 2001 at Glen Canyon National Recreation Area indicate maximum levels for PWC-generated noise at 82 feet of approximately 68 to 76 dBA (Harris Miller Miller & Hanson 2002).</u> Visitors 100 feet from a personal watercraft may be exposed to approximately 75 dB; however, this may be more disturbing due to rapid changes in acceleration and direction of noise <u>than noise</u> from a constant source at 90 dB (US EPA 1974, cited in Izaak Walton League 1999).

### Impact to Visitors from Noise Generated by Personal Watercraft

Pages 90–91, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** Daily PWC use levels would be the same as for alternative A, with a slight change in the area of use. Under this alternative there would be 13 ~~five to seven~~ personal watercraft in ~~each of~~ the Sand Point ~~and Cliffs~~ segment~~s~~ and the western 1 mile of the Cliffs segment. ~~and two craft in the Grand Sable segment.~~ No PWC use would be allowed east of Miners Beach. ~~in the Beaver Basin segment.~~

In most cases, personal watercraft would be dispersed along 8 miles of the lakeshore so that operating craft would be infrequent at any given location. At the areas that have the highest visitor use, such as Sand Point, PWC noise would be diluted by the sounds from wind, waves, other visitors, and motorboats. In general, the use of personal watercraft would result in negligible adverse impacts where other users are concentrated, such as at overlooks and beaches. Within the designated use area ~~At Sand Point,~~ PWC noise would be heard frequently but would not be overly disruptive to visitors because of the high degree of activity that occurs within the area. Thus, PWC noise would have a moderate adverse impact on the soundscapes in the area of designated use. ~~occasionally and would have minor adverse impacts.~~

Backcountry users, particularly in the Beaver Basin segment and along the North Country National Scenic Trail, tend to be more sensitive to sound levels and PWC activity. The intolerance to PWC noise by backcountry users was documented in the summer 2000 visitor survey. Under alternative B personal watercraft would be prohibited east of Miners Beach. ~~from the Beaver Basin segment.~~ Backcountry users in this area might still hear infrequent PWC noise, since craft could still operate outside the 0.25-mile boundary. ~~and in adjacent segments.~~ Thus, eliminating PWC use from the eastern portions of the lakeshore ~~Beaver Basin segment~~ would have minor ~~negligible~~ beneficial impacts to the soundscape because related noise would be less frequent and at a greater distance from shore.

Overall, alternative B would have a minor ~~negligible~~ beneficial effect east of Miners Beach ~~in the Beaver Basin segment~~ and a moderate ~~minor~~ adverse effect~~s~~ near Sand Point and Miners Beach ~~at certain locations along the lakeshore~~ on days when PWC use was relatively heavy. Negligible impacts would occur when use was occasional and distanced from other park users, for example, PWC users operating far from shore. ~~Minor impacts could occur from concentrated use in one area, particularly near Sand Point, where the level of noise could be perceived occasionally.~~ Moderate adverse impacts ~~This~~ would occur mainly where PWC use would conflict with other quieter uses, such as fishing, beach uses, or backcountry camping. In general, the impact to those seeking a quiet visitor experience would most likely be short-term and minor because PWC use would not be constant throughout the day and because the enjoyment of the typical visitor activities in the area would not be compromised. Overall, this alternative would result in a net minor ~~negligible~~ beneficial to moderate ~~minor~~ adverse impact on the soundscape of Pictured Rocks National Lakeshore. All impacts would be temporary, ~~short term~~ since noise would usually be for limited times.

**Conclusion.** Noise from personal watercraft would continue to have short- and long-term, moderate ~~negligible~~ adverse impacts in the area of designated use. ~~at most locations, and short-term, minor, adverse impacts near the Sand Point launch.~~ Impact levels would be related to the number of personal watercraft operating, as well as the sensitivity of other visitors. Eliminating PWC use east of Miners Beach ~~in the Beaver Basin segment~~ would have minor ~~negligible~~ beneficial impacts. ~~since watercraft could still be heard but would be farther away and less frequent.~~

## WILDLIFE AND WILDLIFE HABITAT

### Impact of PWC Use and Noise on Wildlife and Habitat

Pages 94–95, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** The number of PWC users in the lakeshore would be the same as for alternative A, except use would be prohibited east of Miners Beach. ~~in the Beaver Basin segment and would consequently be shifted to other segments.~~ Wildlife impacts under this alternative would be similar to those under alternative A. Due to the low habitat productivity and lack of colonial wildlife along the lakeshore, as well as the low number of personal watercraft in use, impacts to wildlife and wildlife habitat due to PWC activity would be negligible at most locations. Closing eastern portions of the lakeshore ~~the Beaver Basin segment~~ to PWC use would have negligible beneficial impacts. Over the next 10 years impacts would continue to be negligible since PWC numbers would not increase substantially. All wildlife impacts would be temporary ~~and short term~~.

**Conclusion.** Due to the distance that PWC users are required to be from the shoreline, impacts on wildlife and wildlife habitat would be negligible at most locations. ~~Closing the Beaver Basin segment to~~ Prohibiting PWC use east of Miners Beach would have negligible beneficial impacts.

## THREATENED, ENDANGERED, OR SPECIAL CONCERN SPECIES

### Impact of PWC Use on Such Species

Pages 99–100, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** This alternative would allow continued PWC use in the Sand Point segment and the western 1 mile of the Cliffs segment; PWC use would be prohibited east of Miners Beach. ~~except within the Beaver Basin segment.~~ Potential effects would be similar to those described for alternative A and would be limited to interactions with wildlife farther than 200 feet from shore or to personal watercraft landing on shore.

*Piping Plover* — PWC use would not be allowed within the Grand Sable segment, where potential habitat exists, and there would be ~~have~~ no effect on the piping plover~~, as described for alternative A~~. If plovers ever became established in the western end of the lakeshore, then mitigating actions could be required to minimize any adverse effect from PWC use.

*Common Loon and Peregrine Falcon* — No change to text.

*Pitcher's Thistle and Lake Huron Tansy* — PWC use would not be allowed within the Grand Sable segment, where these plants are known to exist. ~~Personal watercraft would have same impacts as for alternative A and~~ Therefore, this alternative would not ~~likely adversely~~ affect the pitcher's thistle or the Lake Huron tansy. ~~Additionally, the~~ Restoration activities proposed for 2002 would have a beneficial effect on the thistle and the tansy.

Overall, PWC use would have no effect on the piping plover, the pitcher's thistle, or the Lake Huron tansy and would not be likely to adversely affect the common loon or the peregrine falcon ~~other federal and state listed species~~ since interactions would be extremely limited.

**Cumulative Impacts.** Cumulative effects for PWC users and other visitors would be similar to alternative A and would not likely adversely affect concerned species or their habitat. PWC use would have no effect in the eastern portions of the lakeshore.

*Piping Plover* — There has been no evidence of plover use in the national lakeshore since 1992. PWC use or motorized boating would not be allowed in areas where critical plover habitat has been designated in the eastern end of the lakeshore. No direct effect on the piping plover is anticipated. If plovers started using habitat within Pictured Rocks National Lakeshore, then PWC and visitor activity would have the potential for adverse effects, and mitigating measures would be taken.

**Conclusion.** PWC use would have no effect on the piping plover, the pitcher's thistle, or the Lake Huron tansy and would not be likely to adversely affect the common loon or the peregrine falcon ~~other federal or state listed species~~ since interactions would be extremely limited.

## SHORELINE VEGETATION

### Guiding Regulations and Policies

Page 101, second paragraph, last sentence — Change as follows:

Personal watercraft are not allowed to operate in waters where the water depth is less than two feet unless the watercraft is being operated at slow, no-wake speed or is being docked or launched. ~~travel through submerged or emergent vegetation or in areas where the water depth is less than 2 feet.~~

### Impact to Sensitive Shoreline Vegetation from PWC Use and Visitor Trampling

Page 104, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** PWC use under alternative B would continue to be allowed in the Sand Point segment and the western 1 mile of the Cliffs segment; use would be prohibited east of Miners Beach. ~~along the shoreline except for the Beaver Basin segment, where use would be prohibited.~~ PWC impacts to shoreline vegetation would be similar to those described for alternative A, since the number of PWC users would not change, although use areas would be modified. Impacts to vegetation east of Miners Beach ~~in the Beaver Basin segment~~ would be negligible and beneficial since users would no longer have access to shoreline areas. Continued PWC use in other segments would have negligible adverse impacts to sensitive shoreline vegetation over the short and long term, with no perceptible changes in plant community size, integrity, or continuity.

**Conclusion.** PWC use would have negligible adverse impacts in the Sand Point segment and the western 1 mile of the Cliffs segment over the short and long term because there have been ~~are~~ no perceptible changes to plant community size, integrity or continuity ~~now~~, and none are expected in the future (2012). PWC restrictions east of Miners Beach ~~in the Beaver Basin segment~~ would result in negligible beneficial impacts to shoreline vegetation.

## VISITOR EXPERIENCE

### Impacts of Personal Watercraft on Visitor Experience Goals

Pages 109–10, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** PWC use under alternative B would continue to be allowed in the Sand Point segment and the western 1 mile of the Cliffs segment; use would be prohibited east of Miners Beach. ~~PWC users under alternative A would be restricted from operating in the Beaver Basin segment.~~ Of the 13 to 16 personal watercraft operating in the lakeshore during peak use, these restrictions ~~this~~ would affect an estimated five to six PWC operators by changing their location of use. ~~three to four users.~~ Additionally, PWC operation would be restricted at certain locations during the permitted use of ethnographic resources.

*Impact on PWC Users* — By prohibiting PWC use east of Miners Beach, ~~in the Beaver Basin segment, it is anticipated that fewer riders would travel from Munising or Sand Point to~~ there would be no use at Twelvemile Beach. Additionally, more PWC riders would stay within the west end of the park, between Munising and Miners Beach. ~~Chapel Rock.~~ Most PWC users (estimated at 60%) would have little or no noticeable change in their location of operation. They could, however, notice more personal watercraft operating within the 8 miles of the shoreline open to PWC use. Voluntarily extending operations farther from shore would likely offset this increase in density. ~~visitor experiences or visitor satisfaction, since there would be minimal restrictions on PWC operations.~~ Under this alternative PWC users would be limited in their location of operation and could be affected by a slight increase in density of use. As a result, visitors who use personal watercraft at Pictured Rocks National Lakeshore would experience moderate ~~negligible~~ adverse impacts.

*Impact on Frontcountry Visitors* — Swimmers, hikers, and other visitors to the Sand Point, Miners Beach, and Miners Castle areas would have slightly more contact with PWC operators than under alternative A because PWC use would only be allowed along this stretch of the lakeshore and would be prohibited east of Miners Beach. ~~users would be displaced from the Beaver Basin segment.~~ The increased amount of contact would not be noticeable in comparison to existing conditions since most activities occur in this stretch of the lakeshore. PWC activity near Sand Point, Miners Beach, and Miners Castle would have negligible adverse impacts on the experiences of swimmers, hikers, and other visitors because personal watercraft must be operated at no-wake speed within 200 feet of the shore and may only travel perpendicular to the shore.

Visitors east of Miners Beach would no longer have contact with PWC users within the lakeshore's 0.25-mile jurisdiction. ~~to Twelvemile Beach and the eastern end of the lakeshore would experience slightly lower PWC numbers because of the Beaver Basin restrictions.~~ Visitors to Chapel Beach and Twelvemile Beach, in particular, tend to look for quieter experiences. Therefore, ~~and~~ this alternative would have a negligible beneficial impact to visitors east of Miners Beach. ~~in the Beaver Basin segment. Visitors to the Grand Sable segment would not experience a noticeable change, and there would be negligible adverse impacts from continued PWC use.~~

*Impact on Backcountry Visitors* — Backcountry visitors east of Miners Beach ~~within the Beaver Basin segment~~ would have decreased contact with PWC users, resulting in a moderate beneficial impact to their experiences. PWC restrictions would particularly enhance the experiences of wilderness visitors in the Beaver Basin segment. ~~Other backcountry~~ Visitors along the North Country National Scenic Trail within the Sand Point segment and the western 1 mile of the Cliffs segment would continue to be occasionally affected by PWC use, with a moderate adverse impact.

**Cumulative Impacts.** Motorized boats and other visitors would continue to interact, with impacts the same as described for alternative A. Cumulative impacts related to the use of personal watercraft, motorized boats, and other visitor activities would be negligible over the short and long term because there would be little noticeable change in the visitor experience

for most visitors. Backcountry visitors east of Miners Beach ~~to the Beaver Basin area~~ would have moderate beneficial impacts because of decreased impacts from PWC use. Most visitors would continue to be satisfied with their experiences at Pictured Rocks National Lakeshore.

**Conclusion.** PWC users would be limited in their location of operation within the national lakeshore and could notice a slight increase in the density of use in the vicinity of Sand Point. As a result, they would experience moderate adverse impacts. Restricting ~~Continued~~ PWC use east of Miners Beach would have negligible beneficial ~~adverse~~ impacts on the experiences of most other visitors in the short and long term, and it ~~restrictions within the Beaver Basin segment~~ would have long-term, moderate, beneficial impacts on those visitors desiring back-country experiences with natural "quiet." The level of PWC use would remain relatively low at ~~other~~ lakeshore locations. When related to other visitor activities, PWC use would not appreciably limit the critical characteristics of visitor experiences.

## VISITOR CONFLICTS AND SAFETY

### Impact of PWC Use and Conflicting Uses on Visitor Safety

Page 115, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** This alternative assumes that PWC operations would continue the same as existing conditions, except that PWC use would be discontinued east of Miners Beach. ~~in the Beaver Basin segment.~~ As a result, the watercraft that normally operate in the eastern portions of the national lakeshore ~~Beaver Basin area~~ would be relocated to the western portion ~~other parts~~ of the lakeshore.

*Personal Watercraft / Swimmer Conflicts* — Impacts would be similar to alternative A since the overall number of personal watercraft operating within the lakeshore would not change. PWC user / swimmer interactions would increase slightly in the Sand Point segment and the western 1 mile of the Cliffs segment because of a shift in PWC use from other locations. However, within 200 feet of the shore PWC operators must travel at no-wake speed and only perpendicular to the shore. ~~the Beaver Basin segment. However,~~ The change in location for PWC operation would not be noticeable to other visitors and would continue to result in minor adverse impacts. In the remaining lakeshore locations there would be little or no conflict between PWC users and swimmers. No conflicts would occur east of Miners Beach, ~~in the Beaver Basin segment,~~ resulting in a negligible beneficial impact to these visitors.

Overall, PWC use would continue to have negligible to minor adverse impacts on most swimmers at Pictured Rocks National Lakeshore. Beneficial impacts would occur east of Miners Beach. ~~in the Beaver Basin segment.~~ Impacts would be perceptible to a relatively small number of visitors at localized areas, primarily at ~~the~~ Sand Point and Miners Beach.

*Personal Watercraft / Other Boat Conflicts* — Impacts would be similar to alternative A. Overall, PWC use would continue to have minor adverse impacts on other motorized boat users at Pictured Rocks National Lakeshore. Impacts would be perceptible to a relatively small number of visitors at localized areas, primarily at the Sand Point launch. ~~beach.~~

**Cumulative Impacts.** Cumulative impacts would be similar to alternative A. The natural separation of use between the various lakeshore visitors reduces the potential for conflicts. For this reason, the cumulative impact of the various user groups on visitor conflicts and safety would be negligible to minor over the short and long term. Beneficial impacts would occur east of Miners Beach. ~~in the Beaver Basin segment.~~ Impacts would be perceptible to a relatively small number of visitors at localized areas, primarily at the Sand Point beach.

**Conclusion.** Continued PWC use would have short- and long-term, minor, adverse impacts on visitor conflicts and safety, particularly in the Sand Point area, due to the number of visitors and boats present on high use days. Conflicts at other locations would remain negligible because use is lower and conflicts would be less likely to occur. Conflicts would be eliminated east of Miners Beach, ~~in the Beaver Basin segment,~~ resulting in negligible, beneficial impacts.

## CULTURAL RESOURCES

### Impact to Cultural Resources from PWC Use and Access to Sites

Page 120, "Impacts of Alternative B" — Change the text as follows:

**Analysis.** PWC users would continue to have access to archeological and submerged cultural resources under this alternative in the Sand Point segment and the western 1 mile of the Cliffs segment; use would be prohibited east of Miners Beach. ~~except in the Beaver Basin segment where they would be prohibited.~~ PWC use would be restricted during the permitted use of ethnographic resources by American Indians.

*Archeological and Submerged Cultural Resources* — Impacts to archeological and submerged cultural resources would be similar to those under alternative A. No PWC-related impacts would occur east of Miners Beach ~~within the Beaver Basin segment,~~ since PWC use would be prohibited. Under this alternative the low number of PWC users within the lakeshore would have only minor adverse impacts on potentially listed archeological resources within the Sand Point segment and the western 1 mile of the Cliffs segment. ~~and Grand Sable segments.~~ Prohibiting PWC use east of Miners Beach ~~within the Beaver Basin segment~~ could have long-term, beneficial impacts on potentially listed archeological sites.

*Ethnographic Resources* — PWC use restrictions east of Miners Beach would result in long-term, beneficial impacts to the use of ethnographic resources. Boat patrols would be conducted in the designated PWC use area during the permitted use of ethnographic resources to monitor and restrict PWC use that could intrude on ~~in proximity to~~ ceremonies, ~~The implementation of boat patrols would limit potential PWC-related intrusions,~~ resulting in short-term, minor, adverse impacts. ~~Continued~~ Impacts ~~would be~~ related to PWC activities outside the lakeshore's 0.25-mile jurisdictional boundary would continue. This alternative would have long-term beneficial impacts to the use of ethnographic resources ~~in the Beaver Basin segment~~ east of Miners Beach, where PWC use would be discontinued.

**Cumulative Impacts.** On a cumulative basis all visitor activities could result in minor to major adverse impacts on those resources that are readily accessible, due to the number of visitors and the potential for looting, vandalism, or (in the case of ethnographic resources) short-term interruption in their use. Boat patrols would be conducted during the permitted use of ethnographic resources to monitor and restrict visitor use in proximity to ceremonies. The implementation of boat patrols would limit potential PWC and other boat-related intrusions, resulting in short-term, minor, adverse impacts. Resources in more remote areas that are not as readily accessible to visitors would likely still experience minor adverse impacts on a cumulative basis, but to a lesser degree due to increased boat patrols. All impact levels would continue at existing levels, with lower impacts east of Miners Beach ~~in the Beaver Basin segment~~ due to the exclusion of PWC use and patrolling during the permitted use of ethnographic resources.

**Conclusion.** PWC use in the Sand Point segment and the western 1 mile of the Cliffs segment ~~and Grand Sable segments~~ could have minor adverse impacts on potentially listed archeo-

logical sites and submerged resources from possible illegal collection and vandalism. There would be a beneficial impact on those resources east of Miners Beach, ~~in the Beaver Basin segment,~~ where PWC use would be discontinued. Boat patrols would limit potential PWC and boat-related intrusions during the permitted use of ethnographic resources, resulting in possible short-term, minor, adverse impacts.

## SOCIOECONOMIC EFFECTS

Page 123, Table 26 — Change the impacts on PWC users and on other visitors or potential visitors for alternative B as follows:

**TABLE 26: IMPACT OF ALTERNATIVES ON USER GROUPS**

| User Group | Alternative B — Continue PWC Use under a Special NPS Regulation with Management Restrictions |
|---|---|
| **PWC Users** | Consumer surplus is expected to decrease ~~slightly~~ as a result of spatial restrictions on PWC use in Pictured Rocks. However, reduced use of the lakeshore by PWC recreationists is not anticipated. |
| **Other Visitors or Potential Visitors** (Canoeists, anglers, other boaters, swimmers, hikers and other visitors) | Consumer surplus is expected to increase for current visitors as a result of increased solitude in the waters east of Miners Beach, ~~off Beaver Basin,~~ which would be restricted from PWC ~~motorized~~ use under this alternative. |

### Costs of PWC Users

Pages 124–25, Impacts for alternative B — Change text as follows:

**Alternative B:** Alternative B would not allow PWC use east of Miners Beach, ~~in the Beaver Basin area,~~ so those PWC users who currently ride in this area would lose consumer surplus, especially if alternate areas were more crowded or less scenic. Nonetheless, alternative B is not expected to affect ~~would have no impact on~~ total PWC visitation to Pictured Rocks, and the impacts of this alternative on consumer surplus would probably be minor.

## NATIONAL LAKESHORE MANAGEMENT AND OPERATIONS

### Conflict with State and Local PWC Ordinances and Policies

Page 126, "Impacts of Alternative B" — Change text as follows:

**Analysis.** PWC use under alternative B would be managed under current state regulations, except use would be prohibited east of Miners Beach ~~in the Beaver Basin segment~~ and during the permitted use of ethnographic resources. These restrictions are within the National Park Service's right to regulate activities that can adversely affect resources within the lakeshore. The additional restrictions would be more restrictive than state PWC regulations, but they would not conflict with state provisions or jurisdiction. Therefore, impacts related to conflicts with federal, state, or local requirements or policies would be negligible.

**Cumulative Impacts.** Personal watercraft are prohibited from landing on Grand Island, a U.S. Forest Service managed island just west of Pictured Rocks National Lakeshore. Implementation of alternative B would not be in conflict with U.S. Forest Service policies. Restrictions on personal watercraft east of Miners Beach and on boats in the Beaver Basin segment would be similar to the existing management in designated primitive areas operated by the U.S. Forest Service. No conflicts with federal or state regulations or policies are anticipated from implementing the restrictions under this alternative. The restrictions would apply only within the lakeshore's jurisdictional boundary. Impacts that are related to conflicts with federal or state requirements or policies would be negligible.

**Impact to Park Operations from Increased Enforcement Needs**

Page 128, "Impacts of Alternative B" — Change text as follows:

**Analysis.** Continuing PWC use within the lakeshore, with restrictions east of Miners Beach, ~~in the Beaver Basin segment,~~ would require increased education and enforcement actions by lakeshore staff. Signs would be posted at the Sand Point launch to indicate PWC location restrictions. Enforcement actions would be required to prevent PWC users from entering the prohibited use ~~potential primitive~~ area. This could be completed using the existing irregular boat patrols, with the anticipation that PWC users would sometimes operate illegally within the lakeshore. To provide more control of PWC operations, daily boat patrols would be needed, requiring three additional permanent staff, the purchase of one more boat, and more funding for park operations.

**Conclusion.** Similar to alternative A, this alternative would have moderate adverse impacts on park operations. More staff, funding, and equipment would be needed to ensure full compliance with PWC and motorized use restrictions east of Miners Beach ~~in the Beaver Basin segment~~ and during the permitted use of ethnographic resources, as well as to regulate motorized uses in other portions of the lakeshore.

# REFERENCES CITED

Add the following reference and correct the second reference as shown:

Harris Miller Miller & Hanson, Inc.
2002 *Draft Technical Report on Noise: Personal Watercraft and Boating Activities at Glen Canyon National Recreation Area*. Produced under contract to the National Park Service. Harris Miller Miller & Hanson Inc.

Oris ~~Ortis~~, J. T., A. C. Hatch, J. E. Weinstein, R. H. Findlay, P. J. McGinn, S. A. Diamond, R. Garrett, W. Jackson, G. A. Burton, B. Allen
1998 "Toxicity of Ambient Levels of Motorized Watercraft Emissions to Fish and Zooplankton in Lake Tahoe, California/Nevada, USA." Poster 3E-P005, presented at the 8th Annual Meeting of the European Society of Environmental Toxicology and Chemistry, April 14–18, 1998, University of Bordeaux, Bordeaux, France.